

What is Claimed Is:

1. A piezoelectric thin film component comprising:  
a piezoelectric thin film; and  
a top electrode and a bottom electrode disposed sandwiching said piezoelectric film; wherein  
the piezoelectric thin film component where crystal grain boundary is formed between a crystal grain and a crystal grain of said piezoelectric thin film, with an orientation discontinuous from the orientation of these crystal grains, and foreign substances separated from said crystal grains hardly exist in this crystal grain boundary.
2. The piezoelectric thin film component according to Claim 1, wherein the width of said crystal grain boundary is 5 nm or less.
3. A piezoelectric thin film component comprising:  
a piezoelectric thin film; and  
a top electrode and a bottom electrode disposed sandwiching said piezoelectric film; wherein  
the piezoelectric thin film component where a crystal grain boundary is formed between a crystal grain and a crystal grain of said piezoelectric thin film, with an orientation discontinuous from the orientation of these crystal grains, and the width of this crystal grain boundary is 5 nm or less.
4. The piezoelectric thin film component according to one of Claims 1 to 3, wherein said crystal grains are columnar with respect to said top and bottom electrodes, and said crystal grain

boundaries exist in roughly vertical direction with respect to said top and bottom electrodes.

5. The piezoelectric thin film component according to one of Claims 1 to 4, wherein crystal orientation of said piezoelectric thin film is (111) or (100).

6. The piezoelectric thin film component according to Claim 1, wherein said foreign substances are a prescribed compound comprised of constituent elements of said piezoelectric thin film, and this piezoelectric thin film is a compound comprised of a composition different from the composition to display piezoelectric functions.

7. The piezoelectric thin film component according to Claim 1, wherein allowable content of said foreign substances is that an upper limit is a value required to allow no residual strain to remain after an electric field is applied to said piezoelectric thin film.

8. The piezoelectric thin film component according to one of Claims 1 to 7, wherein said piezoelectric thin film is formed by an MOD process.

9. The piezoelectric thin film component according to Claim 1 or 3, wherein the orientation of planes of said crystal grains is almost along the orientation of the polarization axis of said piezoelectric thin film.

10. An actuator using the piezoelectric thin film component according to one of Claims 1 to 9 as a mechanical energy source.

11. A method for manufacturing a piezoelectric thin film component comprising:

a process for disposing a top electrode and a bottom electrode sandwiching a piezoelectric thin film comprised of a polycrystalline substance, characterized in that said piezoelectric thin film formation process is executed by an MOD process so that the piezoelectric thin film according to Claim 1 or 3 is obtained.

12. An inkjet type recording head comprising the piezoelectric thin film component according to one of Claims 1 to 9 as an actuator.

12. An inkjet type recording head comprising:

a substrate where ink chambers are created;

a diaphragm which seals one face of said ink chambers and has a piezoelectric thin film component in strain vibration mode fixed on the surface; and

a nozzle plate which seals the other face of said ink chamber and has nozzle holes for ejecting ink, wherein said piezoelectric thin film component comprises the piezoelectric thin film component according to one of Claims 1 to 9.

14. An inkjet printer comprising the inkjet recording head according to Claims 12 or 13.

15. A piezoelectric thin film component comprising a piezoelectric thin film which is strained by applying an electric field, the piezoelectric thin film component where residual strain of said piezoelectric thin film is  $2.5 \times 10^{-4}$  or less.

16. The piezoelectric thin film component according to Claim 15, wherein the piezoelectric constant is 150 pC/N or more.

17. An actuator using the piezoelectric thin film component according to Claims 15 or 16 as an oscillation source.